

The Secretary of Defense Performance-Based Logistics Awards Program
For
Excellence in Performance-Based Logistics
In
Life Cycle Product Support

Section 2
Summary of Accomplishments

Mission Success: In response to an urgent need to ensure weapon system readiness in peacetime and in crisis, the PATRIOT Performance Based Logistics (PBL) Program was created by the US Army. Over nearly a decade, the program has been a successful US Army / Raytheon partnership that consistently delivers mission critical PATRIOT PBL support.

PATRIOT was originally fielded in the 1980's and has been battle proven in Operation Desert Storm and Operation Iraqi Freedom, and most recently successfully deployed to defend Turkey in response to regional instabilities. Throughout its history, PATRIOT has been continuously improved to meet evolving threats consisting of enemy combat aircraft, cruise missiles, and tactical ballistic missiles. Over

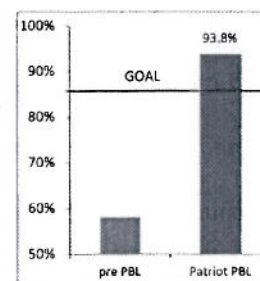


the years, PATRIOT's unrivaled capability has been achieved by employing state-of-the-art technology for the 1000s of system components. The

PATRIOT PBL program is a key to this objective. The clear value created by this effort has enabled the worldwide deployment of PATRIOT - *Global PATRIOT* - the world's pre-eminent Air and Missile Defense system defending the US and growing cadre of 11 allies and providing strategic support to NATO and the Gulf Cooperation Council.

It is clear that the logistics support and technical expertise provided by the PATRIOT PBL Program are major contributors to the continued success of PATRIOT as a tactically deployed and economically sustainable weapon system.

Material Availability: The PATRIOT PBL Program is the first PBL contract within the US Army Working Capital Fund (AWCF) and the US Army Aviation & Missile Command (AMCOM). As a pathfinder program, it represents a continuing US Army / Raytheon partnership for over 8 years

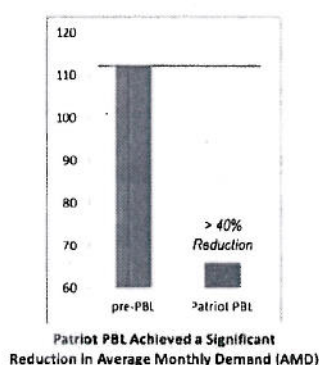


High Demand Satisfaction is Achieved Through the Patriot PBL Program

and \$225M of PBL support. This Program directly supports critical PATRIOT Battery Replaceable Units (BRUs), which are functional assemblies containing hundreds of components each and are supplied under this PBL. Now on its third contract, AMCOM's PATRIOT PBL program continues to exceed all expectations. The demand satisfaction (fill rate) for critical PATRIOT BRUs has been increased from 58 percent under pre-PBL support to the past year's average of 93.8 percent under the PATRIOT PBL Program and reduced the average time to fill any unfilled backorders has been dramatically reduced from 18 months (pre-PBL) to 2 (PATRIOT PBL). These improvements have contributed to PATRIOT consistently performing above the Army's goal of 90 percent Fully Mission Capable (FMC) time for weapons systems.

For the most recent contract, the PATRIOT PBL team has added an innovative metric to highlight the importance of system availability. This new metric specifically measures the fill rate for customer identified critical BRUs that historically drive Non-Mission Capable Supply (NMCS) time.

Material Reliability: Improving material reliability has been one of the main objectives for the US



Army / Raytheon PATRIOT PBL team. By improving the reliability of the BRUs repaired or manufactured, the PATRIOT PBL team has significantly reduced the Average Monthly Demand (AMD) for BRUs and driven increased availability within the PATRIOT Fleet. By utilizing Integrated Product Teams (IPT's) aligned to each of the PATRIOT MEI's, the PATRIOT PBL Team has been able to proactively incorporate lessons

learned from current production or development programs to implement recommended design changes and material replacements into its repairs. This partnering with the IPT's has resulted in a >40 percent reduction in AMD from 111.2 demands / month (pre-PBL) to 67.2 demands / month (PATRIOT PBL). The decrease was achieved during concurrent increases in the size of the PATRIOT Fleet by 37 percent and the number of Authorized Stocked Lines (ASLs) by 55 percent.

Operating & Support Cost Reduction: The PATRIOT PBL Program has received its 3rd contract award. The first PATRIOT PBL contract was awarded in 2006 as a 3 year Firm Fixed Priced (FFP)

contract for \$55.6M with an additional 3 year \$17.3M Cost Plus Fixed Fee (CPFF) contract line to cover un-forecasted demands. The award of this contract resulted in an immediate Business Case Analysis (BCA) reduction of \$2.4M for that 3 year period when compared to a non-PBL support strategy.

The PBL Team was then able to leverage the lessons learned on that contract to award a follow-on contract that passed on a 22 percent BRU unit cost reduction to the US Government (USG). The team placed intensive focus on developing an innovative demand forecasting system that would allow the contract to cover an increased subset of PATRIOT BRUs under the FFP portion of the contract. As a result of these cost savings, a 3 year contract was awarded in June 2009 (\$75.4M FFP and \$9.7M CPFF) showing a 44 percent reduction in CPFF, which increased the estimated BCA savings on PATRIOT PBL to \$24.7M over the 3 year term of the contract.

The present (third) iteration of the PBL contract was awarded in December of 2012 and the team continued to pass on savings to the USG by further reducing BRU costs by another 12 percent. This 2

Cost Savings:
\$38 MILLION
... and growing

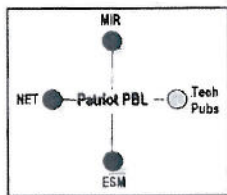
year contract (\$65M FFP with a \$2M CPFF line) covers 40 percent more BRUs (up from 97 to 135), supports 4 more battalions than the initial PBL contract and is expected to save the USG an additional \$11.3M in BCA savings over the 2 year contract term. The cost efficiencies achieved with PATRIOT PBL has resulted in a total BCA savings of \$38.4M over the 7 year life of the PATRIOT PBL contract and is a key enabler of financial risk mitigation for programs such as PATRIOT RECAP and RESET by incorporating support for them into this contract effort.

Public Private Partnering: The third PATRIOT PBL contract has evolved further by establishing a Public Private Partnership (PPP) between the PBL Team and the Letterkenny Army Depot (LEAD) in Chambersburg, PA. Within the framework of this a PPP agreement, LEAD is the primary repair location for a class of BRUs that have been identified by the USG. This creates a win-win situation by leveraging LEAD's repair capacity with Raytheon's engineering and supply chain expertise to improve the availability and reliability of BRUs that have historically impacted system readiness. It also adds LEAD to the ever



expanding PATRIOT PBL team of 1 manufacturing facility, 2 contractor depots, 2 engineering test labs, and 21 major sub-contractors.

Systems Engineering Approach: Raytheon's innovative organizational design has enabled the PBL team to tap into a fully integrated, closed-loop system within Raytheon that supports system engineering for the entire Patriot Air and Missile Defense System. Patriot PBL is physically co-located with the



Patriot PBL is at the Nexus of a System Approach to Increased Reliability and Efficiency

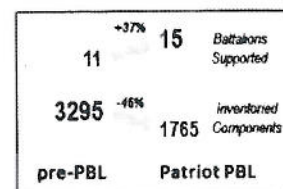
Patriot Major Item Repairmen (MIR), Technical Publications (Tech Pubs), New Equipment Training (NET), and Engineering Services (ESM) Program teams. This tight integration promotes a seamless flow of critical information to the PBL Team from an initial situation assessment by a Raytheon MIR, to the determination of the appropriate corrective action required for its

resolution. Immediately, the PBL Team diagnoses the issue by performing a trend and root cause analyses to determine the nature of the performance issue and recommends corrective actions such as hardware or component replacement, modification of technical documentation and enhanced warfighter training. Any issues that will be corrected by documentation modification or enhanced training are forwarded on to the Tech Pubs and NET teams for immediate implementation. Information on any emerging trends showing risks to system reliability are forwarded to the ESM team for immediate corrective action. By proactively working within this system, the PBL Team is able to ensure that the Patriot Air and Missile Defense System is operating efficiently and effectively.

Footprint Reduction: Reducing the logistics footprint for the system means supporting the PATRIOT fleet with the fewest BRU spares as possible. Since its inception in

2006, the PATRIOT PBL program has successfully reduced the average number of BRU's needed per month to support the PATRIOT fleet from 3,295 to 1,765. This 46 percent footprint reduction occurred in conjunction with significant growths in

material availability and work scope to provide support to 4 additional battalions (37 percent increase), 6 additional ASL's (55 percent increase), and 38 additional BRUs (39 percent increase). This reduction in



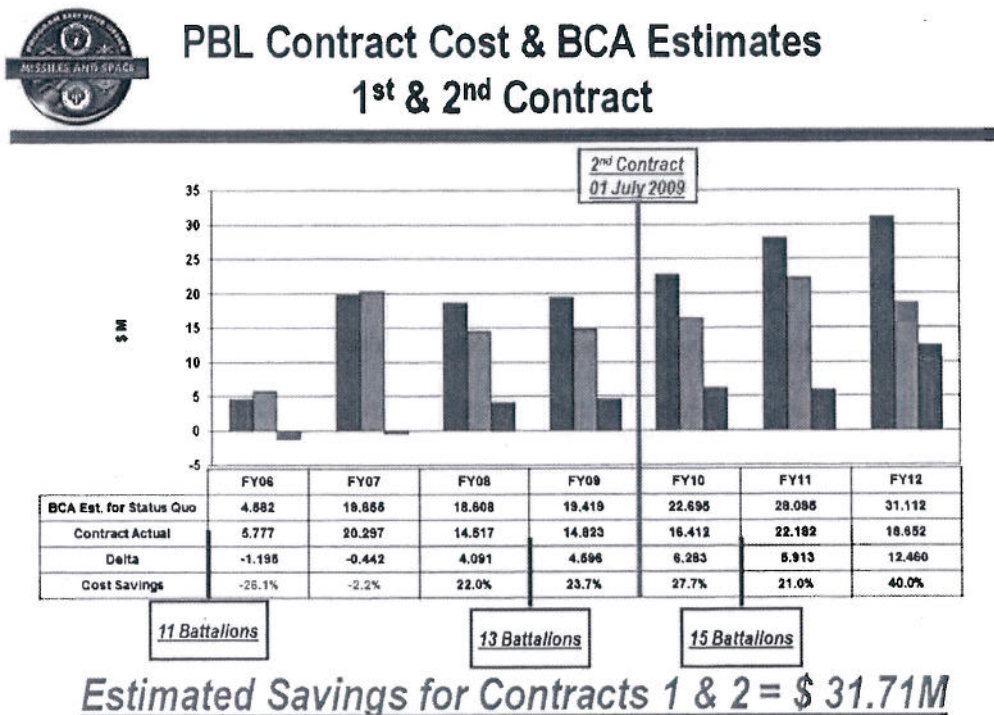
Despite a significant increase in support Patriot PBL reduced BRU inventories

the amount of inventory needed to support a larger fleet has allowed PATRIOT to continue to be the premier missile defense system within the Army and proves that the PBL Team is dedicated to providing outstanding and efficient support to its customer.

Obsolescence Management: Supporting a complex missile defense system with a long operational history presents a unique set of obsolescence challenges to a PBL contract. The PATRIOT PBL Team mitigates these potentially severe issues by leveraging the previously mentioned integrated, systems engineering based solution. The integration with an established and active supplier base and forward looking repair requirements minimize the need for the Army to manage obsolescence within the PATRIOT System, as well as utilizing the built in Government industry Data Exchange Program built into Raytheon's supply chain system. Risk to the USG is further minimized through effective communication between the USG and contractor members of the PATRIOT PBL team and briefings to the end users at the *PATRIOT Quarterly Maintenance Review*. An example of this management is on the Solid State Device (SSD), where the PATRIOT PBL was able perform a lifetime buy at no additional cost to the USG of the soon to be obsolete components within the SSD and ensure its supportability for an additional 5+ years.

Innovative Contract Support Approach: The PATRIOT PBL Program is a flexible contract vehicle that allows the pursuit of innovative strategies to improve material availability and drive program success. To this end, the team has implemented a comprehensive demand forecasting system that allows it to predict potential field failures within a 90 percent confidence interval. The PBL team uses this system to pre-position \$3M per year in material to support repairs at no additional cost to the customer. The Team has also utilized PBL to sign Long Term Agreements (LTAs) for PATRIOT's largest and most expensive BRUs. For example, mission critical High Power Traveling Wave Tube (TWT) carries the single biggest risk of system down time and sustainment cost. Under the TWT LTA, the PATRIOT PBL team realizes a 16 percent cost reduction on repairs and 25 percent cost reduction on new spares for the TWT. The new LTA is anticipated to provide \$25M in cost avoidance across all PATRIOT contracts and to mitigate the TWT as a risk to system operational reliability.

Figure 1: Patriot PBL BCA Savings by Program Year



Any Warfighter - Anywhere - All the Time...

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Figure 2: Patriot PBL Demand Satisfaction (Fill Rate) Improvement by Program Year

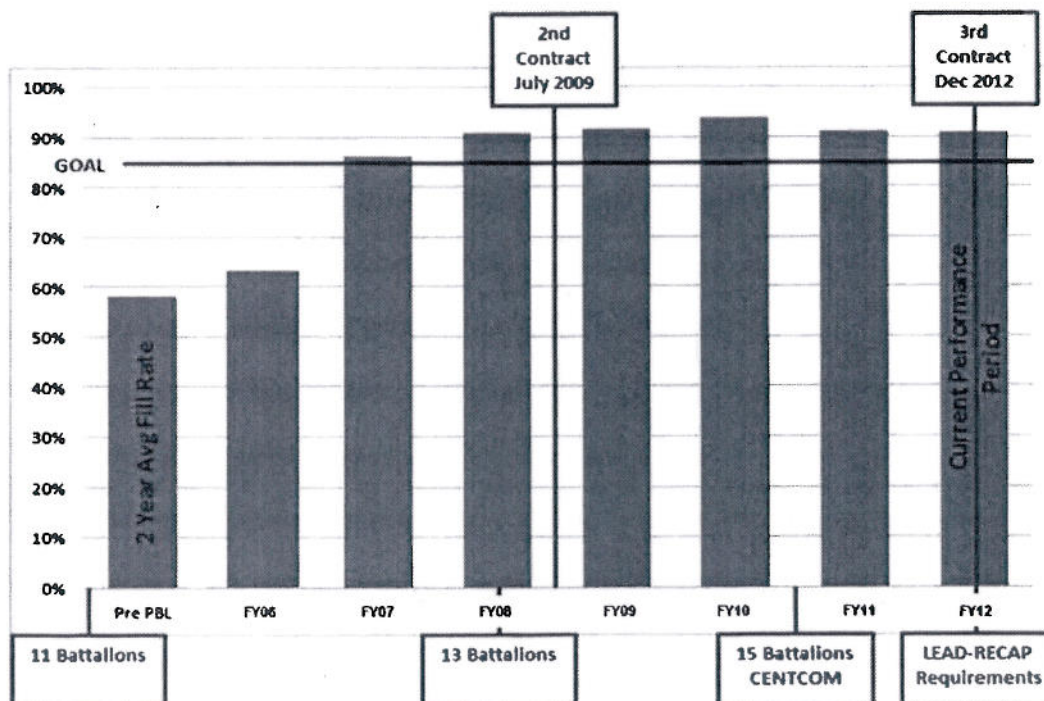


Figure 3: Sample Patriot Fire Unit (4 Fire Units per Battalion)

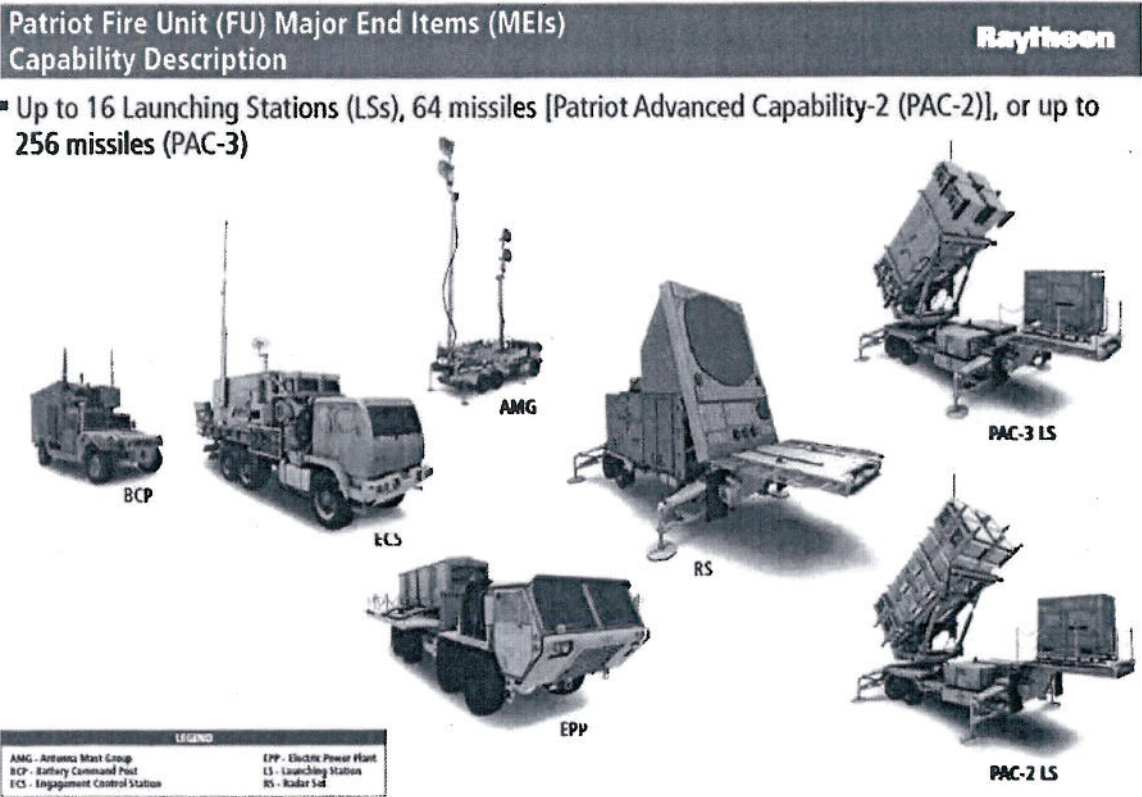
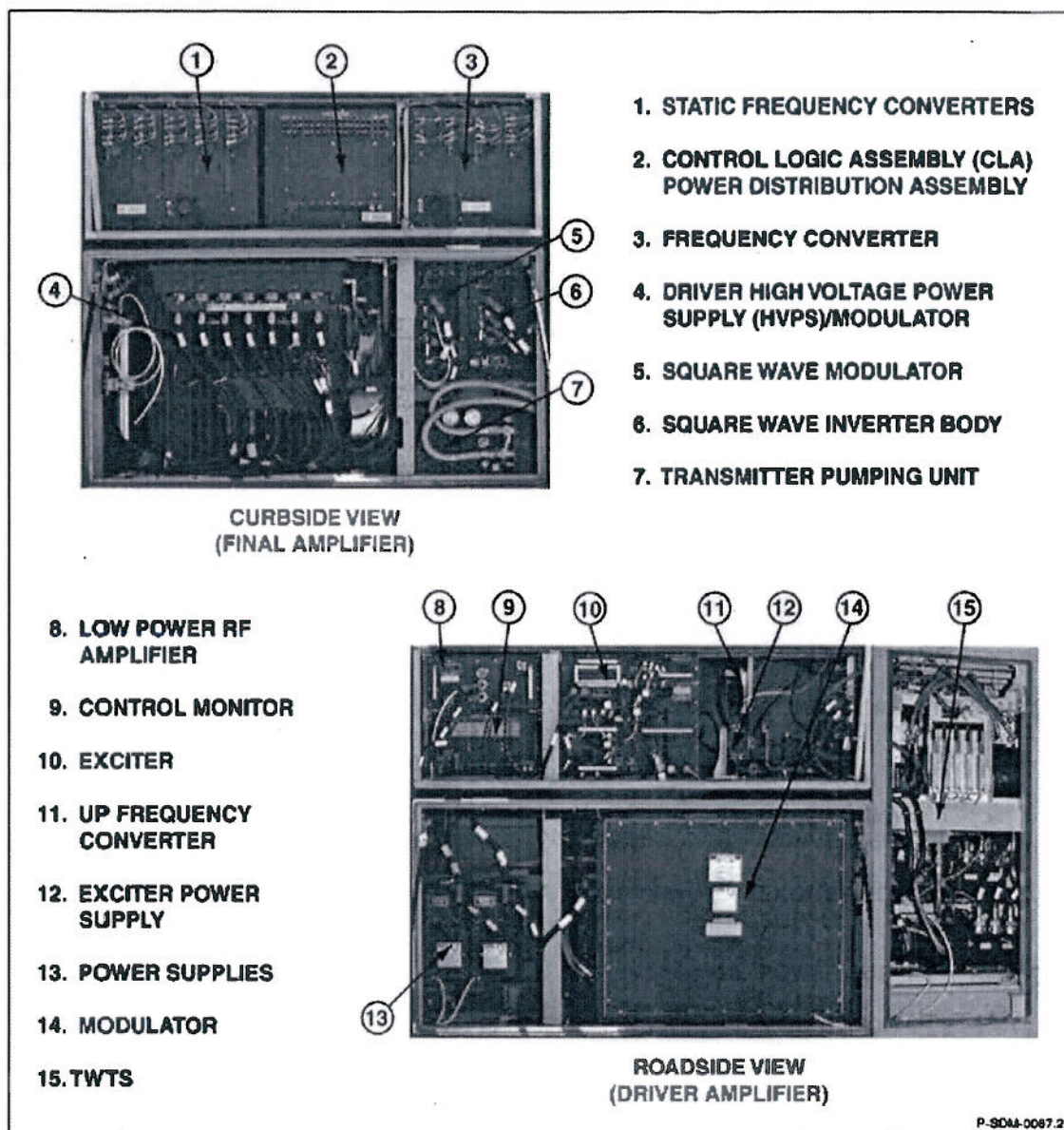


Figure 4: Sample Patriot Battery Replaceable Units (BRUs)



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Section 4

Achievement Summary

The PATRIOT PBL Program has expanded and evolved, continually demonstrating the ability to exceed contract objectives by providing value to the USG and the warfighter who depend on PATRIOT's combat proven Air and Missile Defense capability. The PATRIOT PBL creates a single point of accountability within the Army's logistics supply chain that has driven the PATRIOT PBL team to dramatically increase material availability to 95.7 percent - well above the program goal. Moreover, the program achieved cost reductions that have resulted in \$38.4M in direct savings to the USG and taxpayer while supporting a larger and operationally deployed PATRIOT Fleet with a lower logistic footprint. The innovative and flexible PBL contracting approach continues to focus on responsive, comprehensive, and efficient logistics support as evidenced by the Public-Private Partnership between LEAD and Raytheon as well as through innovative LTAs with suppliers of critical BRUs. Based on the totality of these achievements, the PATRIOT PBL Program is regarded as a model sustainment contract and has set the standard for performance within AMCOM and the AWCF. The unparalleled success of the PATRIOT PBL Program is a major driver for the US Army's decision to keep PATRIOT as its flagship Air and Missile Defense system through 2048 and beyond.



The US Army's PBL Program ensures that the Patriot Air and Missile Defense System is on guard anytime, anywhere, in all conditions.